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September 13, 2002

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DEPAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Marlene H. Dortch Secretary Federal Communications Commission 445 12th Street, SW – Room TW-A325 Washington, D.C. 20554

> <u>Ex Parte Notice</u> – Consolidated Application of EchoStar Communications Corporation, General Motors Corporation and Hughes Electronics Corporation for Authority to Transfer Control, CS Docket No. 01-348

Dear Ms. Dortch:

Re:

In accordance with Section 1.1206 of the Commission's Rules, 47 C.F.R. §1.1206, EchoStar Communications Corporation ("EchoStar"), Hughes Electronics Corporation ("Hughes") and General Motors Corporation ("GM"), Applicants in the above-referenced merger proceeding, submit this letter to report that representatives of the Applicants met with members of the Commission staff on September 12, 2002. FCC staff members who attended the meeting included Barbara Esbin and Marcia Glauberman of the Media Bureau; Jim Bird, Harry Wingo and C. Anthony Bush of the Office of the General Counsel; Donald Stockdale and Simon Wilkie of the Office of Plans and Policy; Tracy Waldon of the Wireline Competition Bureau; and JoAnn Lucanik and Marilyn Simon of the International Bureau.

At the meeting, the Applicants presented additional analysis of the diversion ratios between EchoStar and DIRECTV, as shown in the attached PowerPoint presentation entitled "Further Analysis of the Diversion Ratio Between EchoStar and DIRECTV," and in the attached narrative entitled "Report on Further Analysis of the Diversion Ratio Between EchoStar and DIRECTV." In addition, the Applicants provided their initial response to the criticisms of Professors Li Gan and Paul MacAvoy regarding the competitive effects analysis previously submitted by the Applicants, as shown in the attached PowerPoint presentation entitled "Initial Response to August 30, 2002 Filing by Li Gan and Paul MacAvoy."

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¹ The Applicants also have attached EchoStar and DIRECTV databases and related materials supporting their additional analysis of the diversion ratios between EchoStar and DIRECTV.

Marlene H. Dortch September 13, 2002 Page 2

An original and one copy of this *ex parte* notice (and two copies of the attachments) are being filed with the Commission. If you have questions concerning this meeting or this notice, please do not hesitate to contact the undersigned.

Respectfully submitted,

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Attachment

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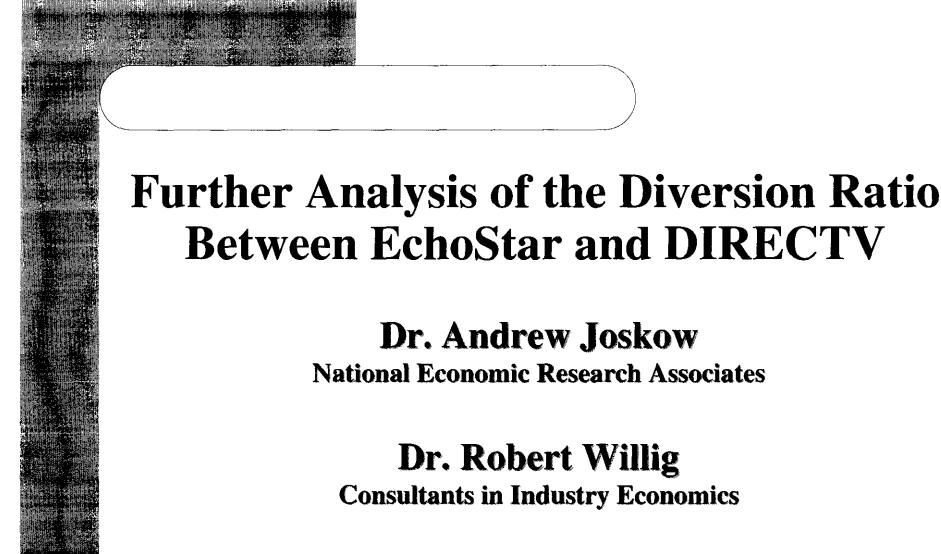
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September 12, 2002

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- In the merger simulation analysis, we relied primarily on survey evidence from DIRECTV to calibrate the nested logit demand structure
- We used a [] diversion ratio from DIRECTV to EchoStar (and a derived [] diversion ratio from EchoStar to DIRECTV). This estimate was based on those subscribers voluntarily disconnecting for price or cost reasons
- Because of the importance of this parameter in the merger simulation analysis, we engaged in additional research on this issue



- Our further analysis suggests that the diversion ratio between the two firms is between [] and []
- This range of results confirms the accuracy of the original estimates of diversion ratios between DIRECTV and EchoStar
- It suggests that the welfare calculations presented based on a [] or [] diversion ratio from DIRECTV to EchoStar are reliable indications of the effect that the merger between EchoStar and DIRECTV will have on consumers
- Indeed, the effect of the merger could be appropriately analyzed with a figure closer to []. The reasons are (1) a number of appropriate methodologies (e.g., examining changes in switching rates around the time of price increases) produce diversion ratios at the [] of the range; (2) a variety of conservative corrections for those who may not have been counted are used; and (3) the broadest sample produces results at the [

] of the diversion ratio range

Use of a figure closer to [] is consistent with a flat logit model of demand
 or a nested logit structure where the nest is of de minimis influence



METHODOLOGY

- We obtained subscriber databases from both companies, which included information on each subscriber's name, address, and phone number
- We examined the complete set of subscribers who disconnected DIRECTV over the past 2-1/2 years and matched them to new subscribers in the EchoStar database
- We examined the complete set of subscribers who disconnected from EchoStar and matched them to new subscribers in the DIRECTV database
- We analyzed how the diversion ratio between the two firms changed after DIRECTV and EchoStar implemented price increases
- We generally used a match of telephone numbers to determine whether a customer who left one firm switched to the other firm and vice versa
- We use various techniques to correct conservatively for imperfections in the database matching (e.g., people who move when they disconnect)



- [] of the subscribers who voluntarily left DIRECTV in 2001 were found <u>at any time after they left</u> DIRECTV in the EchoStar database
- Even if we adjust for "movers," the diversion ratio from DIRECTV to EchoStar in 2001 is conservatively estimated to be less than []
- As emphasized in our previous presentation, antitrust analysis suggests examining diversion ratios due to price increases
- If we examine changes in the switching rates at the time of DIRECTV's August 2000 price increase, we estimate that the diversion ratio is [



- Roughly [] of the subscribers who left DIRECTV voluntarily or involuntarily in 2001 were found <u>at any</u> <u>time after they left DIRECTV</u> in the EchoStar database
- If we adjust for "movers," the diversion ratio for voluntary and involuntary churners in 2001 is conservatively estimated to be less than [____]
- If we examine changes in the switching rates at the time of DIRECTV's August 2000 price increase, we estimate that the diversion ratio is []



- Roughly [] of EchoStar subscribers who voluntarily disconnected during 2001 were found in the DIRECTV subscriber base at any time after they left EchoStar
- Even if we adjust for "movers," the diversion ratio from EchoStar to DIRECTV in 2001 is conservatively estimated to be less than []
- If we examine changes in the switching rates at the time of EchoStar's price increases in May 2000 and February 2001, we estimate that the diversion ratio is
 []: between [] and []
- For EchoStar subscribers who disconnected voluntarily and involuntarily in 2001, [] were found at any time after they left EchoStar in the DIRECTV subscriber base

CONCLUSION

- The most appropriate diversion ratio between the two firms appears to be between [] and []
- DIRECTV to EchoStar are reliable indications of the effect that the merger between EchoStar and DIRECTV will have on consumers calculations based on either a [] or [] diversion ratio from This analysis provides further confirmation that the welfare
- allowing customers up to 21/2 years to "show up" in the other firm's analyzed with a diversion ratio from DIRECTV to EchoStar that is subscriber base), the effect of the merger could be appropriately Since we utilize a variety of conservative assumptions (e.g., closer to []
- A [] diversion ratio from DIRECTV to EchoStar is consistent with a flat logit model of demand - or a nested logit structure where the nest is of de minimis influence

Report on Further Analysis of the Diversion Ratio Between EchoStar and DIRECTV

Dr. Andrew Joskow National Economic Research Associates

Dr. Robert Willig Princeton University

A key element in simulating the potential welfare effects from the merger between EchoStar and DIRECTV is an estimate of the diversion ratio between the two firms. That is, it is important to have an estimate of the extent to which customers would leave EchoStar for DIRECTV were EchoStar to increase its price, as well as an estimate of the extent to which customers would leave DIRECTV for EchoStar were DIRECTV to raise its price. Here, as has previously been explained, it is not possible to estimate econometrically these diversion ratios because of the limited amount of price variation that is observed in the available data. Both firms price their product on a national basis and have not changed these prices very often, so the data are not sufficient for an econometric estimate of this parameter.

Instead, the econometric analysis relied primarily on survey evidence from DIRECTV to provide an estimate of the extent to which customers leave DIRECTV for EchoStar. (The analysis relied to a lesser degree on survey evidence to determine the diversion ratio from EchoStar to DIRECTV.) DIRECTV conducts a monthly survey of the customers who disconnect from their service to learn more about why they left DIRECTV and from which provider, if any, they are now purchasing multichannel video products. In those surveys, [] of the customers who left DIRECTV due to cost or price reasons, over the course of the most recent 12 months for which we had these data, indicated they had switched to EchoStar. Thus, this [] figure was viewed as the best forward-going estimate of the diversion ratio from

¹ See, for example, Dr. Robert Willig, The EchoStar-Hughes Merger Simulation: Technical Notes, August 19, 2002.

DIRECTV to EchoStar. Use of the [] DIRECTV-to-EchoStar ratio meant in turn that the merger simulation model presumed a [] diversion ratio from EchoStar to DIRECTV.²

Given the importance of this parameter in the analysis, we have continued to work to find alternative ways to measure the magnitude of the diversion between the two firms. Specifically, we have looked at the complete set of subscribers who left DIRECTV over roughly the last two and a half years and determined how many of these subscribers subsequently became EchoStar subscribers. We have also looked at the subscribers who disconnected from EchoStar to see the extent to which these subscribers switched over to DIRECTV. In addition to just looking at the numbers of subscribers who switched from one DBS service to the other on a month-by-month basis as a percentage of all subscribers leaving that DBS service, we also looked at how these numbers changed after DIRECTV or EchoStar implemented a price increase, as a way of relating this switching behavior to changes in prices.

As discussed in more detail below, further analysis suggests that the diversion rate between the two firms is between [] and []. This range of results alone confirms the accuracy of the original estimates of diversion ratios between DIRECTV and EchoStar. It suggests that the welfare calculations previously presented based on a [] or [] diversion ratio from DIRECTV to EchoStar are reliable indications of the effect that the merger between EchoStar and DIRECTV will have on consumers. Indeed, the effect of the merger could be appropriately analyzed with a figure closer to []. The reasons are (1) a number of appropriate methodologies (e.g., examining changes in switching rates around the time of price increases) produce diversion ratios at the low end of the range; and (2) a variety of conservative corrections for those who may not have been counted are used; (3) the broadest sample produces results at the [] of the diversion ratio range. Use of a figure closer to [] is consistent with a flat logit model of demand – or a nested logit structure where the nest is of de minimis influence.

The analysis we conducted included the following steps: we identified all of the subscribers who left DIRECTV each month from August 1999 to February 2002. For each

² This is because our model generates the diversion ratio in the other direction based on the two companies' MVPD market shares.

subscriber, we had information on the subscriber's name, address, and phone number. For the August 1999 to February 2002 time period, we also obtained EchoStar's entire subscriber database, which also included each subscriber's name, address, and telephone number. We used the telephone numbers of the subscribers who left DIRECTV and matched them to the telephone number of the subscribers in the EchoStar database who activated at any point after the subscriber left DIRECTV.³ For each such match, we counted the subscriber as having switched from DIRECTV to EchoStar.⁴

The database categorizes disconnecting subscribers to a limited degree. The largest category of subscribers who disconnect from DIRECTV have a general "disconnect" code associated with them, while other subscribers who disconnect have various codes associated with them that suggest they were disconnected because of non-payment.⁵ To be consistent with our previous analysis, we initially focus our discussion below on the subscribers in the general "disconnect" category, since this is the closest to the "voluntary" disconnect category we examined previously.

Attachment 1 shows the month-by-month number of people who left DIRECTV and, of those people, the number and percent who are found in the EchoStar database at any point in time after having left DIRECTV. As the table shows, the largest percentage in any given month equals [] and the lowest percentage equals []. The number of subscribers who

³ We also did the analysis where we limited our search to subscribers who activated the EchoStar service within three months of having left and within six months of having left DIRECTV. We focus below on the results with regard to subscribers who activate EchoStar service at any point in time after leaving DIRECTV, because it is the most conservative approach that takes into account the fact that some subscribers might not immediately switch MVPD service providers.

⁴ Matching on anything other than phone numbers, such as the name of the subscriber, is difficult to implement on a systematic basis across the entire database. Spellings of names may not be the same in the two databases, so matches may be missed. In addition, finding the same name in the two databases does not necessarily mean it is the same person. However, we did some preliminary work on various matching approaches beyond phone numbers for selected months, to see by how much our estimates based solely on phone number matches might understate true switching between the two firms. Our results suggest that matching on additional criteria would not change our results in any meaningful way from the ones discussed here.

⁵ These codes represent categories such as "in collection," "cut off" and "write off."

switched from DIRECTV to EchoStar during 2001 as a percentage of all subscribers who left DIRECTV is roughly [].6

We also studied how the switching behavior changed as a result of the price increase DIRECTV announced in August of 2000. To do this, we focused on the change in the number of subscribers leaving DIRECTV for EchoStar before and after the price increase divided by the difference in the total number of subscribers leaving DIRECTV before and after the price increase. The theory behind this calculation is that it controls for the baseline amount of disconnects from DIRECTV and the baseline switching from DIRECTV to EchoStar. It looks at how many of the additional subscribers who disconnect after the price increase switch to EchoStar. This approach to the measurement of diversion gives a ratio of [18].

It is also appropriate to consider the switching behavior of all subscribers that disconnect from DIRECTV or EchoStar, not just those who disconnect voluntarily. Subscribers who are disconnected because, for example, they did not pay their bill may be

(Subs to Echo₂ - Subs to Echo₁)/(DTV Disc.₂ - DTV Disc.₁)

where:

Subs to Echo₂ = in the six months following the DIRECTV price increase, the number of DIRECTV subscribers switching to EchoStar

Subs to $Echo_1 = in$ the six months preceding the DIRECTV price increase, the number of DIRECTV subscribers switching to EchoStar

DTV Disc.₂ = in the six months following the DIRECTV price increase, the total number of DIRECTV subscribers disconnecting service

DTV Disc.₁ = in the six months preceding the DIRECTV price increase, the total number of DIRECTV subscribers disconnecting service

⁶ If data from the first two months of 2002 had been used, the percentage would have been even lower, but to be more conservative we limited this calculation to the data from 2001. Attachment 2 shows the month-by-month number of people who left DIRECTV and, of those people, the number and percent who are found in the EchoStar database within three months of having left DIRECTV. Using this method, [] percent of subscribers leaving DIRECTV are found in the EchoStar subscriber base.

⁷ That is, we calculated:

⁸ We use the data presented in Attachment 5 for this calculation. Using the data in Attachments 1 or 2 produces [diversion rates of [] and [], respectively.

When using the DIRECTV survey evidence, we think there is less value in looking at the involuntary disconnects, given that the circumstances under which a subscriber was disconnected may influence the way the former subscriber answers the questions. Nonetheless, the switching rate from DIRECTV to EchoStar is even lower for involuntary disconnects than for voluntary disconnects in the churn tracker survey. Thus, the exclusion of involuntary disconnecting subscribers was conservative.

reacting to price changes. Indeed, it could be a price increase that leads them to no longer be able or willing to pay their bill. Attachment 3 presents the data for those subscribers who switch to EchoStar within the universe of all subscribers that disconnect from DIRECTV. In 2001, the fraction who diverted to EchoStar among all subscribers who disconnected was []. Conducting the analysis of how switching behavior changes around the August 2000 price increase using voluntary and involuntary disconnects leads to a diversion ratio of [].

There is a possibility that the approach to matching described above may miss people who switched to EchoStar but also switched their phone number at the same time. For example, people may move at the same time they switch from one provider to the other. Based on additional analysis and information, we conclude that these factors are not likely to result in missing large numbers of subscribers switching from DIRECTV to EchoStar.

Nevertheless, even if we conservatively adjust for the possibility of undercount due to phone number switches, the results would not be materially different. Data from DIRECTV indicate that roughly [] of the subscribers who voluntarily disconnect from DIRECTV cite moving as a reason¹³ for their disconnecting from the service.¹⁴ To assess the effect of this issue, under the extreme assumption that all of the DIRECTV movers change their phone

¹⁰ We use the data adjusted for movers (see text below) for this calculation. These data are presented in Attachment 4.

It is conceivable that a subscriber may have two phone lines and set up their new account using the second phone line. Estimates suggest that fewer than 30 percent of all households have two phone lines. See, for example, http://www.jdpower.com/global/jdpaawards/releases/080800-te.asp. While the vast majority of these phone lines are likely used for dial-up Internet connections, some households may be indifferent between the home phone number that they give to MVPD providers. Such a bias is likely to be small - we know of no evidence that shows many households use multiple home phone numbers for various services. It seems likely that most households have a single primary home phone number.

Matching on phone numbers can also bias the results in the other direction. For example, suppose that Person A disconnects from DIRECTV in April 2000 and moves from his home. In December 2001, Person B moves into the area and signs up for EchoStar. It is possible that the phone company may have provided Person B the same phone that Person A had. In that case, we would count "one" person as switching from DIRECTV to EchoStar, even though they were two different people.

¹³ This probably overstates the extent that moving and disconnection are related, since DIRECTV executives note that people cite moving as a reason for leaving, even when it is not the case.

Data from the Census Bureau indicate about 16% of the general population moved from March 1999 to March 2000. See Jason Schachter, Geographical Mobility: Population Characteristics, March 1999 to March 2000, Current Population Reports, U.S. Bureau of the Census, May 2001. Of those persons cited by the Census Bureau, however, more than half moved within the same county and, therefore, some of these people may have been able to move and keep their phone number.

numbers, we would need to adjust the data to account for these changed phone numbers. One way to do this is to examine the number of people counted as switching from DIRECTV to EchoStar as a percentage of the number of people disconnecting from DIRECTV excluding those who cited moving when they disconnected. Attachment 5 has the month-by-month data on voluntary disconnects adjusting for the number of people that cite moving as a reason for their disconnection. This would lead us to conclude that the diversion ratio from DIRECTV to EchoStar for 2001 would be less than []. This is an overly large upper bound to the extent that diverting movers keep their telephone numbers.

We also adjust the data on all disconnections (voluntary and involuntary) from DIRECTV. We take a similarly conservative approach to adjusting these data. We assume that the proportion of involuntary disconnects who are also moving is the same as the proportion of voluntary disconnects who are also moving.¹⁵ Adjusting for subscribers that move and disconnect, the diversion rate based on <u>all</u> disconnections is [].

The analyses discussed above were also conducted looking at the subscribers that left EchoStar and switched to DIRECTV. Attachment 6 has the month-by-month count of the number of subscribers who disconnected from EchoStar along with the number of subscribers who we could match, based on phone numbers, in the DIRECTV customer database and that activated at some point after having left EchoStar. These numbers are limited to the subscribers who were identified in these data as disconnecting voluntarily. As the table shows, these numbers are similar in magnitude to the number of subscribers leaving DIRECTV for EchoStar, and the average percentage of disconnecting subscribers switching from EchoStar

¹⁵ We make this assumption because DIRECTV does not collect data on the number of involuntary disconnects who are also movers. (Such data are available for voluntary disconnects because they are asked whether they are moving when they call to disconnect.)

Attachment 7 has the number of subscribers leaving EchoStar voluntarily that are found in the DIRECTV database within three months of having left EchoStar. The diversion ratio from EchoStar to DIRECTV in 2001 based on these numbers is [].

to DIRECTV during 2001 is [].¹⁷ Attachment 8 has the comparable data on all disconnects from EchoStar. Using these data, the average percentage of subscribers switching from EchoStar to DIRECTV during 2001 is [].

EchoStar had two price increases during the time period we examined, so we also looked at how the prevalence of switching from EchoStar to DIRECTV was affected by these price increases. That is, we performed the same calculation described above for the period around DIRECTV's price increase, except we looked at the time period before and after May 2000 and the time period before and after February 2001, the two months in which EchoStar raised its price. The diversion ratios from EchoStar to DIRECTV calculated for these two time periods are [] and [], respectively.

As with the subscribers leaving DIRECTV, we may be missing some people who switch because their phone numbers have changed since having left EchoStar. We do not have similar data from EchoStar on the number of people who cite moving as a reason for disconnection. However, if the proportion of people who cite moving as a reason for voluntary disconnection from EchoStar is similar to that for DIRECTV, then diversion from EchoStar to DIRECTV would be [].

This direct measurement of the switching behavior of EchoStar and DIRECTV customers confirms that the welfare calculations previously presented based on either a [] or [] diversion ratio from DIRECTV to EchoStar are reliable indications of the effect that the merger between EchoStar and DIRECTV will have on consumers. Indeed, given that the corrections for those that may not have been counted are conservative and that a number of appropriate methods presented for analyzing switching behavior resulted in lower figures, these results indicate that the effect of the merger could be appropriately analyzed with a diversion rate from DIRECTV to EchoStar that is closer to [].

¹⁷ The methodology used in our merger simulation analysis leads to a higher diversion ratio from EchoStar to DIRECTV than from DIRECTV to EchoStar. In the data we are using here, we are getting a smaller diversion from EchoStar to DIRECTV, which is generally consistent with the limited survey evidence we have from EchoStar.

HIGHLY CONFIDENTIAL ATTACHMENTS 1-8 REDACTED



Dr. Robert WilligConsultants in Industry Economics

Dr. Andrew Joskow
National Economic Research Associates

September 12, 2002

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Gan-MacAvoy Claim 1: Cable is Not the Closest Competitor to Each DBS Service

CLAIM: Gan-MacAvoy claim that diversion ratios are not appropriate for measuring competition between products. The two DBS products are closer substitutes for each other than cable because the cross elasticity with respect to the price of EchoStar is higher for DIRECTV than it is for cable. (See pp.2-3)

RESPONSE:

- As per the Merger Guidelines, the diversion ratio is the appropriate measure of substitutability in the context of mergers. The cross partial of cable demand with respect to DIRECTV price is far greater than the cross partial of EchoStar demand with respect to DIRECTV price. (Likewise for the cross partials with respect to EchoStar price.) These cross partials determine diversion ratios.
 - Merger Guidelines: "The price rise [from a merger] will be greater the closer substitutes are the products of the merging firms, i.e., the more buyers of one product consider the other product to be their next choice." (1992 Guidelines, § 2.21)
 - Merger Guidelines: "Throughout the Guidelines, the term 'next best substitute' refers to the alternative which, if available in unlimited quantities at constant prices, would account for the greatest value of diversion of demand in response to a 'small but significant and nontransitory' price increase." (1992 Guidelines, § 1.11)

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Gan-MacAvoy Claim 2: The Willig-Joskow Nested Logit Model of Demand and McFadden Random Utility Theory

CLAIM: Gan-MacAvoy claim that the Willig-Joskow model is not consistent with McFadden's random utility maximization theory because the nest parameter (σ) exceeds 1. (See pp.3-4)

RESPONSE:

• Contrary to the Gan-MacAvoy claim, the σ we find <u>is smaller than one</u>, so we <u>do not</u> contradict utility maximization. (See Technical Notes, p.11.)

Gan-MacAvoy Claim 3: Calibrating the Nest Parameter (σ)

CLAIM: Gan-MacAvoy claim that we calibrate the diversion ratio incorrectly since the churn data that we use include DBS subscribers who churn because of changes in the price of other products and for reasons other than price (such as service problems). (See pp.4-5)

RESPONSE:

- First, contrary to the Gan-MacAvoy claim, we analyze diversion ratios surrounding price increases by one DBS firm. For example, EchoStar did not change its price during the time period directly following DIRECTV's price increase.
- Second, if cable actually raises its price in response to DIRECTV's price increase then we actually <u>overestimate</u> the diversion ratio from DIRECTV to EchoStar (even fewer people leaving DIRECTV would have joined EchoStar without any cable price increase).
- Third, we confine the use of the churn tracker survey to those subscribers who disconnected due to price and cost reasons.

Gan-MacAvoy Claim 3: Calibrating the Nest Parameter (σ)—Contd.

CLAIM: Gan-MacAvoy claim that you can get higher or lower values of σ by calibrating using different diversion ratios. They conclude that this shows the unreliability of our approach. (See p.5)

RESPONSE:

• We provide extensive sensitivity analysis to cover a reasonable range of diversion ratios. (See Tables 4.2 and 4.4, Addendum 3, Technical Notes.) Available data suggest that the actual diversion ratio is in the lower end of the range that we test.

Gan-MacAvoy Claim 4: Bertrand-Nash Competition

CLAIM: Gan-MacAvoy claim that there is an important disparity between the marginal cost implied by Bertrand competition and EchoStar's "observed" marginal cost. Likewise for DIRECTV. (See p. 7) Using these observed costs, they claim that the marginal cost decreases needed to offset the negative effects of the merger exceed our predicted marginal cost savings. Hence, consumers necessarily lose. (See pp. 8-9)

RESPONSE:

- The "observed" marginal cost that Gan-MacAvoy use does not include subscriber acquisition costs (SAC) or amortizes SAC over too long a time period. Hence, their elasticities and welfare analysis are flawed.
- The pre-merger marginal cost based on EchoStar data including SAC amortized over EchoStar's target payback period is consistent with the marginal cost implied by our Bertrand-Nash model.
- Our model shows that modest declines in marginal cost are enough to improve consumer welfare by hundreds of millions of dollars.



CLAIM: Gan-MacAvoy assert that we define a single "nationwide" market and therefore imply that we assume services in the East Coast compete with services in the West Coast. (See p.1, p.11)

RESPONSE:

• In our simulation model, we assume that each cable firm prices locally (and independently of one another) and the DBS firms price nationally.

Gan-MacAvoy Claim 7: Uncabled Areas

CLAIM: Gan-MacAvoy claim that "...by assumption there are no markets [in our analyses] where cable services are absent." (See p.12)

RESPONSE:

• We explicitly account for non-cabled areas in our analysis. (See discussion in Technical Notes, p.20)

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